Milk quality – where procedures and routine meet

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There are pairs of things in this world that working independently of each other have little, or even negative, value. Yet when combined, these forces create a perfect union that enhances everything associated with the pair.

Take milk quality, for instance. It is no secret that milk quality is driven by multiple factors, but the elements occurring in the milking parlour have a huge impact. The most critical of those elements are the procedures operators use to harvest milk from the cow, and the routine they follow to ensure milk is harvested in a timely, yet healthy, fashion.

Table 1 shows the relationship between operator procedure and parlour routine. Obviously, for the highest level of milk quality, producers want to trend towards the upper right quadrant as much as possible. Where does your herd fit? To answer that question an assessment of what is going on in the parlour needs to be completed.

We need to start by setting some goals. The goal of any dairy should be to find an optimal balance between parlour throughput and the harvest of large volumes of high quality milk. But let's get more specific.

How many cows per hour, or turns of the parlour, do you want to achieve? How many times are cows going to be milked each day? What milk quality goals (bacteria count, somatic cell count) do you have? What about animal health goals, such as number of clinical infections?

The duration of pre-cleaning should be considered bearing in mind its stimulation effect.

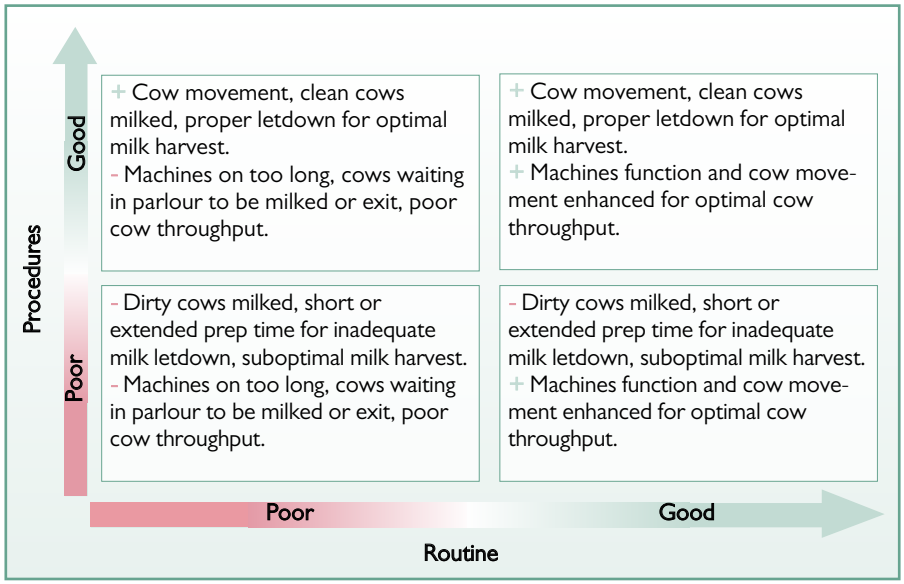

Table 1. The relationship between operator procedure and parlour routine.

Once goals are set, we can develop a strategy on how to reach them and the time it takes to complete, starting with the procedures being used by the operators in your parlour. First, let's define what procedures lead to clean cows, proper milk letdown and optimal milk harvest.

Operator procedures

The people harvesting the milk have a tremendous impact on efficiency and milk quality. Appropriate operator procedures lead to good hygiene at the teat end. Proper milk letdown can actually enhance parlour throughput. Make sure the following milking procedures are followed in your parlour.

Visual inspection

As cows enter the parlour, look at the udders for any swollen quarters or injured teats. When they enter the stall, wipe away any excessive dirt on the teats. If washing the udder is necessary, make sure it is completely dry before moving to the next step. If the water is not removed, bacteria filled water can enter the milking unit and come in contact with teat ends, increasing the risk of udder infections.

Pre-dip

When applied, a proven, effective teat dip needs to cover 75-90% of the teat surface. This process should normally take 4-10 seconds. Once the teat dip is applied, it is recommended to stay on the teats for 20-30 seconds. The procedure has proven to significantly reduce the levels of environmental pathogens on the teat skin that increase the risk of intramammary infections. It should be noted that pre-dipping is not allowed in all countries.

Forestripping

This is an important step in stimulating milk letdown and the efficiency of milk harvest. This is also the time to visually detect abnormalities such as flakes or clots in the milk, which are early signs of mastitis.

This process normally takes 5-10 seconds.

Forestripping is sometimes skipped because it is seen as a time consuming,

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labour intensive task. However, studies have shown that cows that are forestripped milk out faster and many times have a lower SCC.

Wiping/drying

Wiping with a single-service towel should take place approximately 60 seconds after the operator's first contact and normally takes 5-12 seconds.

Wiping the teats provides additional stimulation needed for milk letdown while removing environmental pathogens and organic materials, especially at the teat end.

Attachment/alignment

The milking unit should be attached 60-90 seconds after the start of udder stimulation. At this time, teats should be full of milk. Once the unit is attached operators should align the unit to assure even milk flow is established from all four quarters and liner slips are minimised. Liner slips represent air leaking into the machine, which can influence the milk harvest process, causing irritation to the teats and eventually decrease milk quality by admitting contaminates into the milking system. Depending on the stall configuration, attachment and alignment normally takes an average of 7-12 seconds.

Optimised cubicle hygiene reduces working time In pre-milking udder preparation.

End of milking

Towards the end of milking, liner slips tend to occur more often because the teat wall collapses with the opening and closing of the liner. As the cow nears the end of milking the teat's internal pressure is less, causing the teat wall to react with the liner wall movement. The teat wall movement stresses the seal between the teat and liner wall, increasing the risk of liner slips.

When liner slips occur a sudden vacuum drop in the milking unit may cause small droplets of milk to propel back against the teat end. In some instances milk carrying bacteria may enter the teat canal, increasing the potential of a machine-induced infection.

Droplets of milk impacting the teat caused by liner slips should be avoided. Operators should respond to liner slips and readjust and/or realign the milking unit as soon as possible.

Unit removal

The milking unit should be removed at the time milk flow level decreases below a predetermined set point. For manually detached milking units, operators should shut off the vacuum before removing the unit to avoid sudden vacuum drops, thus helping reduce the potential for new infections.

Automatic detachers should be adjusted for proper vacuum delay to avoid milking units being detached at higher vacuum levels. If automatic take-offs are used the

Healthy teat skin is the best natural protection against mastitis.

detacher settings should be matched to operator procedures and routines to minimise over- or undermilking.

Post-dipping

Once the milking unit is removed, apply a proven effective post-dip to kill the bacteria on the teat skin, preventing bacteria from possibly entering the teat canal and causing infections. Post-dipping also removes the milk film left after the machine comes off.

If not removed the film would be a good food source for growing bacteria populations. Once again, make sure the post-dip covers 75-90% of each teat.

Parlour routine

How these procedures are executed and repeated over the course of a milking determines parlour routine. The following are a few benchmarks that indicate good parlour routine:

- Cows should enter the milking stalls as soon as the stall entrance gate is opened.

Execution of prepping procedures over the course of a milking determines parlour routine.

Cows should walk approximately 2-3ft (0.5 -1.0m) per second while moving to their designated stall.

- The first cow obtaining her position in the milking stall should receive the pre-milking procedures as soon as possible. This will vary, but in facilities with multiple operators this should be started within the first 10 seconds.
- Time for pre-milking procedures will vary depending on the procedures selected and the number of operators. The goal should be to define the milking routine best suited to accomplish good milking hygiene and milk letdown. Units are normally attached to the cow 60-90 seconds from the start of stimulation to assure maximum peak milk flow.
- Cows should be grouped to assure milkout times are comparable and slow-milking cows do not delay the release of cows from one side of the parlour.

Details in parlour routine are of major importance. The case study (inset) is an example of excellent operator procedures that are not fully optimised because of poor parlour and operator routines.

This case study exemplifies how even the best procedures can go to waste if proper parlour routine is not followed. When proper procedures and routine meet, cows are clean, have proper letdown time and move through the parlour efficiently to improve parlour throughput. And when both are achieved, you will reap the benefits of higher production, better udder health and improved profitability. ■

Case study

The dairyman has an excellent operator training program and states that his operators follow the procedures very closely, but teat ends are poor and milk quality is suffering. Cows are milked in a double-28 parallel parlour with manual milking unit detachers.

The cows enter into one side of the parlour and the operators start at the front of the parlour with the pre-milking procedures as they are trained to do. Their procedures first appear to be excellent, and it is obvious that they are well trained. Once the side is prepped and machines are attached, the employees start prepping and attaching machines at the front of the second side, following the same procedures. To this point, operators are well spaced and everything looks good.

But, by the time all of the units are attached on the second side, the operators are nearly shoulder to shoulder, so pre-dip kill time and milk letdown times are not nearly where they should be. To make matters worse, the operators simply turn around and start manually removing the machines from the cows at the back of the first side and work their way forward.

By the time they remove the milk machine from the first cow on the first side, it is obvious cows in the front of the parlour are severely overmilked. Instead of removing machines from the cows that had been milking the longest, they had moved to the ones that were closest to them. This causes cows in the beginning of the first row to be milking too long and, possibly, cows at the back of the row not milking long enough.